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- 1 Acceptance
- 2 Participation
- 3 Transdisciplinarity

## AG AKZEPTANZ FACT SHEET (1): ACCEPTANCE

# THE ROLE OF ACCEPTANCE FOR THE ENERGY TRANSITION

### WHAT IS ACCEPTANCE?

The term acceptance is not uniformly defined in social science discourse. However, acceptance usually refers to socially positive attitudes toward something in the sense of affirmation or approval.

- **Acceptance**  
 Actual, empirically surveyed Acceptance
- **Acceptability**  
 Approvability, hypothetical acceptability

### WHAT ROLE DOES ACCEPTANCE FOR THE ENERGY ENVIRONMENT?

With the Climate Protection Act 2021, the Federal Republic of Germany has set itself the goal of becoming climate neutral by 2045. The Kopernikus projects are to make a contribution to this, too (Kopernikus vision). The goal of climate neutrality can only be achieved if energy demand is significantly reduced, fossil raw materials are replaced by renewable energies in as many areas as possible, and energy efficiency is further increased. Within this

societal transformation process, public acceptance of technological developments and social innovations is a key success factor. The understanding of social acceptance ranges from local technology acceptance by residents in relation to generation plants such as wind farms, to grids, to user acceptance, as in the transport sector. Acceptance is a key success factor along the entire value chain – it thus affects communities, regions, the national and European level, and even international relations, as in the case of the UN climate goals.

### 3 FACTS ABOUT ACCEPTANCE IN THE ENERGY TRANSITION (RESEARCH)

1

At the local level, three out of five (61%) of respondents would like the public to be more involved in decisions about the energy transition in their city or community (SNB, 2023).

2

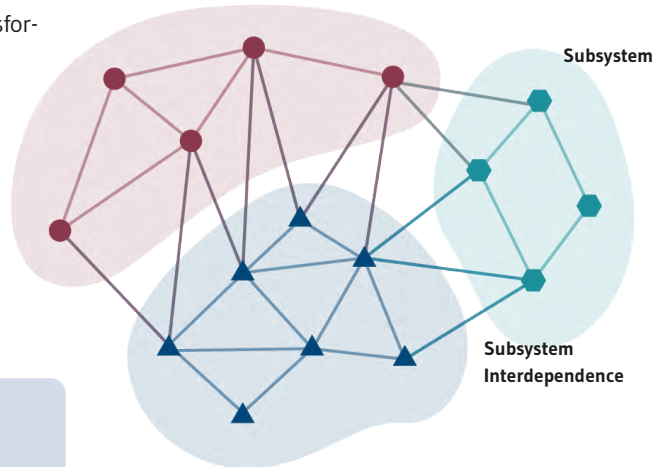
66% of Germans are of the opinion that the German government should take further measures to advance the energy transition (SNB, 2023).

3

More than 70% of Kopernikus researchers consider acceptance research in inter- and transdisciplinary projects on the energy transition to be necessary (Hildebrand, 2023).

# THE ENERGY TRANSITION AS A SOCIO-TECHNICAL SYSTEM

In acceptance research, the energy transition is viewed as a socio-technical system or as a socio-technical transformation. In this context, the relationships and interactions (interdependencies) between social and technical systems are highlighted and investigated. The energy transformation consists of both (primarily) technical subsystems, as well as (primarily) social subsystems.



**(primarily) Technical Subsystems**  
 Power plants of various types, high-voltage lines, distribution networks, substations, storage power plants, oil refineries, pipelines, large tankers, production facilities for oil, gas and coal, open-cast mines for uranium and lignite ...

**(primarily) Social Subsystems**  
 Political frameworks and incentive systems such as the Renewable Energy Sources Act, changing information and governance structures in the course of digitalization, the roles of municipal utilities and energy supply companies, of users, i.e. energy consumers in the private and industrial sectors, of those affected who protest against new infrastructures and citizens who invest in wind farms and biogas plants ...

## HOW CAN ACCEPTANCE BE ANALYZED?

In acceptance research, acceptance is studied on the basis of the relationships between subjects and objects of acceptance in a particular context.

- **Acceptance object:**  
What is to be accepted?
- **Acceptance subject:**  
Who is to accept something?
- **Acceptance context:**  
Within which (political and/or technological) framework conditions is something to be accepted?

## HOW CAN ATTITUDES AND BEHAVIOR BE DIFFERENTIATED?

- **Attitude**  
Measures the valuation dimension: How does an acceptance subject value an acceptance object? It ranges from negative to positive.
- **Behaviour**  
Measures the behavioral dimension: How does an acceptance subject behave towards an acceptance object? It ranges from passive/tolerating to active/acting.

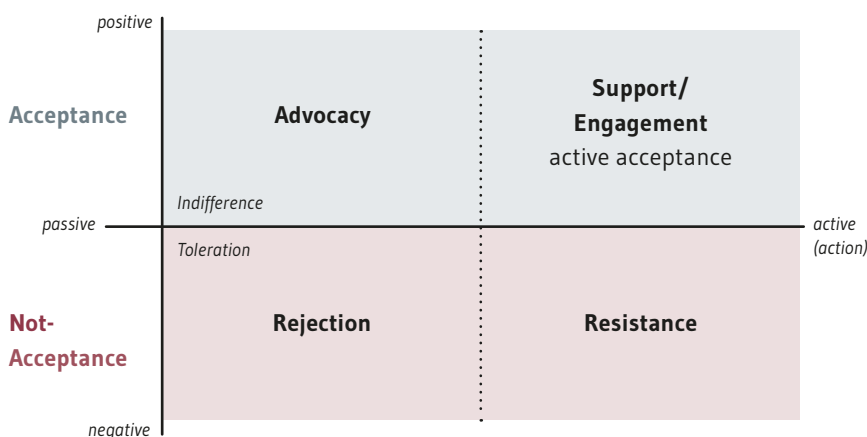
## HOW CAN ACCEPTANCE BE MEASURED?

The mapping of acceptance with its two aspects attitude and behaviour in a twodimensional scale results in a matrix, which is used to distinguish acceptance from non-acceptance. The two upper quadrants represent acceptance, i.e. both endorsement and support/commitment.

## WHAT ARE THE DIMENSIONS OF ACCEPTANCE?

**Common models of acceptance differentiate three dimensions.**  
 The three levels are interdependent, i.e. they influence each other.

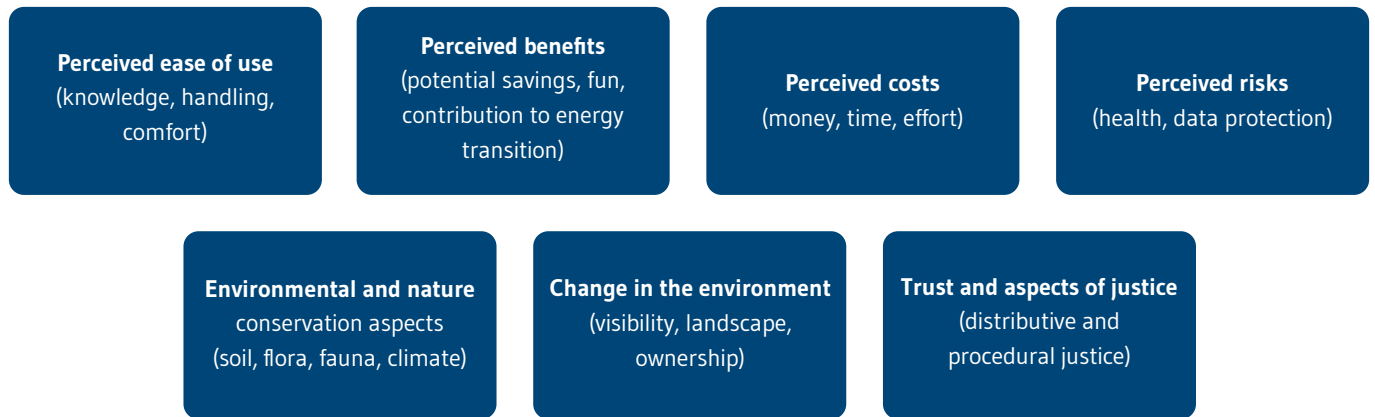
## THE ACCEPTANCE MATRIX by Schäfer & Keppler, 2013



- 1 The overall **socio-political acceptance** of the energy and climate transition.
- 2 the **market acceptance** by prevailing economic structures, institutions and organizations
- 3 the **local acceptance** of persons directly affected by energy transition measures (e.g. re-newable energy plants, grid expansion, etc.), associations and municipalities.

## WHAT INFLUENCES ACCEPTANCE?

In acceptance research, various **technology acceptance models (TAMs)** have emerged to systematize acceptance factors. The central categories of factors with relevance for acceptance are considered to be:



## WHAT TECHNOLOGY-SPECIFIC ACCEPTANCE FACTORS ARE KNOWN?

Wind Power	Power Grid	Smart Grid/ Flexibility Technologies
<ol style="list-style-type: none"> <li>1. Visual emissions from wind turbines (WTGs), e.g. lighting, shadow cast</li> <li>2. Acoustic emissions from wind turbines, e.g. (infra-)noise</li> <li>3. Effects on the scenery, e.g. visibility, aesthetics</li> <li>4. Conservation concerns, e.g. bird/bat protection, construction measures (esp. in the forest)</li> </ol>	<ol style="list-style-type: none"> <li>1. Effects on the scenery, e.g. visibility, Aesthetics, aisle formation</li> <li>2. Environmental concerns, e.g., soil pollution due to heat emission, construction work, clearing</li> <li>3. Health risks due to electromagnetism</li> <li>4. Alternatives, e.g. overhead line versus underground cable, new construction versus modernization</li> <li>5. Impaired property and real estate values</li> </ol>	<ol style="list-style-type: none"> <li>1. Lack of knowledge regarding understanding, complexity and necessity of smart grid technologies</li> <li>2. Privacy concerns and concerns about invasion of privacy perceived threat of cyber attacks</li> <li>3. Impairment of autonomy due to compulsory installation, costs for installation versus savings potential through own energy saving behavior</li> </ol>

Table 1: Central factors for the acceptability of different energy technologies with European focus, own compilation

## HOW DO SOLUTIONS HAVE TO BE DESIGNED SO THAT THEY ARE ACCEPTED IN THE LONG TERM AND BY THE BROAD MAJORITY?

Acceptance is not a static indicator, but dynamic, because people change their attitudes.

Acceptance can be encouraged. Two central prerequisites for this are target group-specific and professional intervention. Because acceptance is subjective and dependant on the point of time, individual perception and context, there can be no guarantee of „acceptance procurement“ (which, by the way, would also be questionable in view of an enlightened view of man). In principle, acceptance can be promoted by increasing the

(perceived) benefit, while (perceived) burdens can be reduced and/or compensated. In addition, there are acceptance-subject-oriented, acceptance-object-oriented and acceptance context-oriented strategies (see Table 2). In the event of conflicts of interest, mediation can make a contribution. All these strategies should be embedded in professionally designed participation processes.

## WHAT STRATEGIES CAN PROMOTE ACCEPTANCE?

Acceptance Object Orientation	Acceptance Subject Orientation	Acceptance Context Orientation
(Re-) Design of the technology to be accepted: User centric design	<b>Transfer of knowledge, competence and know-how</b> <ul style="list-style-type: none"> <li>• Communication and public relations work</li> <li>• Test opportunities, display and demonstration demonstration objects, „lighthouse projects“</li> <li>• Local contact persons, testimonials</li> </ul>	Participation opportunities
		Design of spatial context, e.g. site selection
	<b>Conflict management, mediation</b>	Design of social context, e.g. workplaces
		Financial compensation for burdens and financial participation
		Reference to higher-level, normative goals, e.g. sustainable development
		Design of the introduction and implementation process (planning, development, commissioning)

Table 2: Strategies for promoting acceptance, own representation according to Schäfer and Keppler, 2007, p. 42 f

## THREE QUESTIONS FOR DR. STEFFI OBER



**Dr. Steffi Ober** heads the Economics and Research Policy Team at NABU e.V. and is the initiator of the Civil Society Platform Research Turnaround. She is also a guest lecturer at the University for Sustainable Development in Eberswalde. In the Kopernikus project SynErgie, she leads the dialogue in the Energy Flexible Model Region Augsburg and is spokesperson of the Kopernikus-wide WG Acceptance.

### 1. What should energy transition actors know about the topic of „acceptance“?

Acceptance is the key to the energy transition. The best technological solutions fail if they are not well explained and communicated in advance, and potential conflicts are dealt with and resolved on site.

### 2. What are some common misconceptions about the topic of acceptance?

Acceptance is not something that can be „stuck on“ afterwards by social sciences.

There are no guarantees. People are free to decide against it.

### 3. Which framework conditions support the acceptance of the energy transition?

If possible, the exchange on site or with the affected stakeholders should be integrated into the design of a project, a change or a new technology from the very beginning on. Only if those affected also become stakeholders who can contribute their values and attitudes, conditions for acceptance will improve.

## QUOTED AND FURTHER LITERATURE

- Hildebrand, Jan (2023): *Was denken Energiewende-Forscher\*innen über Akzeptanzforschung? Ergebnisse der Befragung „Akzeptanzforschung in den Kopernikus-Projekten“*, In: *Akzeptanzforschung in den Kopernikus-Projekten. Gemeinsam für eine sozial robuste Energiewende*, 47-54.
- Wolf, Ingo; Ebersbach, Benita; Huttarsch, Jean-Henri (2023): *Soziales Nachhaltigkeitsbarometer der Energie- und Verkehrswende 2023. Was die Menschen in Deutschland bewegt – Ergebnisse einer Panelstudie zu den Themen Energie und Verkehr*.
- Schäfer, Martina; Keppler, Dorothee (2013): *Modelle der technikorientierten Akzeptanzforschung – Überblick und Reflexion am Beispiel eines Forschungsprojekts zur Implementierung innovativer technischer Energieeffizienz-Maßnahmen*
- Fact Sheet 2: Participation, Fact Sheet 3: Transdisciplinarity



[www.kopernikus-projekte.de/aktuelles/news/akzeptanz-report](http://www.kopernikus-projekte.de/aktuelles/news/akzeptanz-report)

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